WHAT IS CLAIMED IS:

1. An axial shaft seal disposed between a housing wall and a rotating shaft, the axial shaft seal comprising:

an outer ring insertable into the housing wall in a stationary and sealing manner, the outer ring including a sleeve including a polymer material extending radially inward and having a spring bellows form, a radially inward end portion of the sleeve having a first sealing surface; and

an inner ring connectable to the shaft in a non-twisting and sealing manner and including a ring flange extending radially outward so as to provide a second sealing surface for axially mating the first sealing face.

- 2. The axial shaft seal as recited in claim 1, wherein the inward end portion of the sleeve includes circular ring extending in a radial direction.
- 3. The axial shaft seal as recited in claim 1, wherein the inward end portion deviates from a radial normal direction by up to max. 30°, when not axially mating the second sealing surface.
- 4. The axial shaft seal as recited in claim 2, wherein the circular ring includes one or more sealing surfaces.
- 5. The axial shaft seal as recited in claim 1, wherein the first sealing surface includes lubricant-recirculating grooves.
- 6. The axial shaft seal as recited in claim 1, wherein the first sealing surface includes a friction-reducing coating.
- 7. The axial shaft seal as recited in claim 6, wherein the coating includes PTFE.

- 8. The axial shaft seal as recited in claim 1, wherein the sleeve includes a folded bellows.
- 9. The axial shaft seal as recited in claim 8, wherein the bellows open toward a lubricant side of the seal.
- 10. The axial shaft seal as recited in claim 1, wherein the outer ring includes a reinforcement member.
- 11. The axial shaft seal as recited in claim 2, wherein the circular ring includes a reinforcing plate.
- 12. The axial shaft seal as recited in claim 1, wherein the ring flange includes lubricant-recirculating grooves.
- 13. The axial shaft seal as recited in claim 1, wherein the inner ring is made of metal.
- 14. The axial shaft seal as recited in claim 1, wherein the inner ring is at least partially sheathed with a polymer material.
- 15. The axial shaft seal as recited in claim 1, wherein the inner ring includes a plurality of projections extending radially inward for providing an axial stop with a shoulder of the shaft.
- 16. The axial shaft seal as recited in claim 1, wherein the inner ring includes a circular flange for providing an axial stop with a shoulder of the shaft.
- 17. The axial shaft seal as recited in claim 1, wherein the ring flange includes a radial extension having an outer portion, and further comprising a sensor disposed at the housing wall and one of a transmitter wheel and a multi-pole wheel cooperating with the sensor to measure at least one of a rotational speed and shaft displacement.

- 18. The axial shaft seal as recited in claim 1, wherein the inner ring includes a cylindrical part, and further comprising an auxiliary flange disposed on the housing wall, a sensor disposed on the auxiliary flange and one of a transmitter wheel and a multipole wheel for cooperating with the sensor.
- 19. The axial shaft seal as recited in claim 1, wherein the inner ring includes a cylindrical part that includes one of a transmitter wheel and a multipole wheel, and further comprising an auxiliary ring having a non-repellant washer mounted, the outer ring being mounted in the auxiliary ring.
- 20. The axial shaft as recited in claim 19, wherein the washer is made of a non-woven material.